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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,728	01/30/2001	Hiroyoshi Tanimoto	PM 0245692 081225	2553

7590 06/25/2004

Mr. Roger R. Wise
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Los Angeles, CA 90017

EXAMINER

HOGAN, MARY C

ART UNIT PAPER NUMBER

2123

DATE MAILED: 06/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,728

Applicant(s)

TANIMOTO, HIROYOSHI

Examiner

Mary C Hogan

Art Unit

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 1/30/2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 01/30/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This application has been examined.
2. **Claims 1-20** have been examined and rejected.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file, specifically, Japanese Patent Application number 2000-085050, filed 3/24/00.

Specification

4. The disclosure is objected to because of the following informalities. Appropriate correction is required.
5. The specification contains grammatical errors, for example, **page 4, line 11** "...curtail...", **page 6, lines 29-30 and 32-33**, "...are the diagram showing result of experiment...". Applicant's cooperation is requested in correcting any errors of which the applicant may become aware in the specification.
6. The specification contains grammatical errors, for example, **page 4, line 11** "...curtail...", **page 6, lines 29-30 and 32-33**, "...are the diagram showing result of experiment...". A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

Drawings

7. The drawings are objected to because of the following:
8. **Figure 2, element S206** contains a misspelling: "currier" should be "carrier". Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency.

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Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. **Figures 7A and 7B** should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. As to **Figure 7A**, the specification states (**page 10, lines 10-11**) "Generally, in the device simulation, the current preservation formula as shown in **Figure 7A** is solved." This sentence implies that the formula is prior art. **Figure 7B** is a definition of a term included in **Figure 7A (page 10, lines 19-24)**, implying that it is also known in prior art. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

10. **Claims 2,5,7,10,12,15,17 and 20** are objected to because of the following informalities. Appropriate correction is required.

11. **Claims 2,7,12 and 17** recite "...is effected on..." which is grammatically incorrect. The claims should be corrected to read "...is effected by..."

12. **Claims 5,10, 15 and 20** recite "...extracted repeatedly varying..." which is grammatically incorrect. The claims should be corrected to read "extracted repeatedly **by** varying..."

Claim Interpretation

13. **Claims 1-20** recite "extinction speed" and "extinction mechanism". While a definition for these terms is unclear from the specification, one can be extracted from the explanation of leak current on **Page 11, lines 20-25**. From this explanation, it is concluded that leak current is formed when carriers (electrons) are generated but cannot recombine (with a hole), therefore, left to flow as current. The rate at which carriers are generated and the rate at which they can

recombine will determine the leak current that flows in an electrode. From this explanation, it is concluded that "extinction mechanism" and "extinction speed" refer to the recombination of these carriers (electrons) with holes.

14. **Claims 4,9,14 and 19** state "...issues an output by multiplying a charge amount to each integral value of each carrier generation and extinction mechanism.". This phrase is unclear in meaning and the specification does not give an explanation as to the meaning of this term. Therefore, it is concluded that this claim is directed to the output of information after simulation.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

16. **Claims 1-20** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification broadly refers to integral value calculator, volume integration, surface integration, line integration, carrier generation, extinction mechanism/speed, SRH process, impact ionization, inter-band tunneling and charge amount. However, the specification does not provide any substantive detail, other than broad reference, to these concepts in such a manner to enable one skilled in the art to which it pertains to make and/or use the invention.

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

18. **Claims 1-20** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

19. **Claims 1-20** are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. For example, **Claims 2, 7, 12 and 17** recite "...is effected on..." which is grammatically incorrect. Further, **Claims 5, 10, 15 and 20** recite "...extracted repeatedly varying..." which is grammatically incorrect.

20. **Claims 1-20** recite the following terms: extinction mechanism, extinction speed, volume integration, surface integration, line integration, and charge amount, however, no definitions of these terms are given in the specification, and therefore render the claims vague and indefinite.

21. **Claims 4, 9, 14 and 19** recite "...issues an output by multiplying a charge amount to each integral value of each carrier generation and extinction mechanism.". This phrase is unclear in meaning and renders the claim vague and indefinite.

Claim Rejections - 35 USC § 102

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

23. **Claims 1-20** are rejected under 35 U.S.C. 102(b) as being anticipated by Hurkx et al (Hurkx et al, "A New Analytical Diode Model Including Tunneling and Avalanche Breakdown", IEEE Transactions on Electron Devices, Vol. 39, No. 9, September 1992), herein referred to as **Hurkx**.

24. As to **Claims 1-20**, **Hurkx** teaches circuit simulation (**page 2090, column 1, last 5 lines**) using a model that integrates a carrier generation and extinction mechanism (**page 2091, column 2, equation 8**), the carrier generation and extinction mechanism including an SRH process (**page 2091, column 1, equation 4 and description**), impact ionization (**page 2091, column 1, equation 3 and description**), and inter-band tunneling (**page 2091, column 1, second bullet, and column 2, equation 10**). Further, **Hurkx** teaches extracting and outputting electrical characteristics by repeatedly varying a bias condition to the semiconductor device (**Figures 6 and 7, Table 1 and descriptions**).

Conclusion

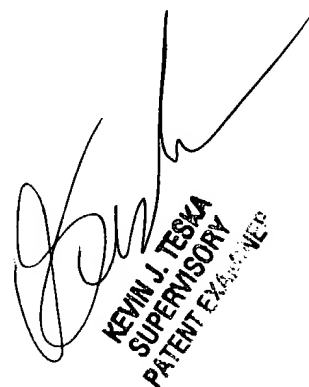
25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

26. Hurkx et al, (Hurkx et al, "A New Recombination Model for Device Simulation Including Tunneling, IEEE Transactions on Electron Devices, Vol. 39, No. 2, February 1992) teaches SRH process, inter-band tunneling, and impact ionization.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C. Hogan whose telephone number is 703-305-7838. The examiner can normally be reached on 7:30AM-5PM Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703-305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C Hogan
Examiner
Art Unit 2123


KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER